THE CLIMATE OF LISBON

AND OF THE TWO HEALTH RESORTS IN ITS IMMEDIATE NEIGHBOURHOOD

MONT' ESTORIL, ON THE RIVIERA OF PORTUGAL, AND CINTRA

BY

DR. D. G. DALGADO

OF THE ROYAL ACADEMY OF SCIENCES OF LISBON

A PAPER READ BEFORE THE SECTION OF HYGIENE OF THE FIFTEENTH INTERNATIONAL CONGRESS OF MEDICINE, HELD AT LISBON IN APRIL, 1906. MODIFIED AND ENLARGED, WITH AN APPENDIX CONTAINING NOTES ON MONT' ESTORIL

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PREFACE

The following pages contain a paper read by me before the Section of Hygiene of the Fifteenth International Congress of Medicine, held at Lisbon in April last. In publishing it, in the form of a pamphlet, I have taken the opportunity of making some alterations and additions. In an Appendix, I have given supplementary information regarding water-supply, drainage and hotels, with an historical note on Mont' Estoril, which, it may be hoped, will contribute to stimulate greater interest in the place. I have also added a table showing the correspondence between the metrical and the British systems of measuring distances, heights and temperatures.

The word 'climate' usually conveys to the mind, both of the professional and lay reader, the idea of its usefulness chiefly in consumption. This is a disadvantage; for, as a matter of fact, there are some diseases in which a change of air, to a congenial climate, is much more beneficial, either as preventative or curative, than in consumption. It is for some such diseases that Mont' Estoril is recommended.

D. G. D.

The Trossachs,
July, 1906.

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THE CLIMATE OF LISBON, MONT' ESTORIL AND CINTRA

GENTLEMEN,—The subject of my paper is 'The Climate of Lisbon and of the Two Health Resorts in its immediate neighbourhood—Mont' Estoril, on the Riviera of Portugal, and Cintra'; and its object is to show:

1. That the climate of Lisbon in winter, as well as in other seasons, is not variable, as it has been stated by some eminent English writers;
2. That Mont' Estoril, as a winter health resort, is in many respects superior to Biarritz, Nice and Catania; and
3. That Cintra, 'the most blessed spot in the habitable globe' of Robert Southey, is a very desirable and charming health resort in summer, but not in winter.

Portugal, this 'garden planted upon the most westerly coast of Europe,' enjoyed for a long time, amongst foreigners generally and Englishmen in particular, the reputation of having one of the healthiest, mildest, and most equable climates of the world. During the latter half of the eighteenth century some English invalids, amongst whom was Fielding,[1] the novelist, came to Lisbon for a change of air; but the real value of this city as a health resort was not fully appreciated till about 1790.

The earliest English author who, to my knowledge, gives a description of the meteorological features of Lisbon is James Murphy[2] in 1795. He quotes the observations made by the Rev. Herbert Hill in the years 1783, 1784, and 1785.

In 1797 Robert Southey, the poet, who resided in Cintra for a short time, gives a glowing description of that place—

> 'Where the tired mind
> Might rest beyond the murmurs of mankind!'

and, in alluding to its climate, says: 'I have felt a positive pleasure in breathing there.'[3] Such a description, coming from so distinguished an author, the Poet Laureate of his day, must have engendered at the time great partiality in favour of Portugal, both amongst the public and the profession, for in those days there was no *Lancet*, no *British Medical Journal*.

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[1] Fielding had been suffering from dropsy, and the reason he gives for selecting Lisbon in preference to Aix is that it is four degrees to the south, and therefore the air here 'must be mild and warm, and the winter shorter and less piercing.' *Vide* 'The Journal of a Voyage to Lisbon,' London, 1755. The latest edition appeared in 1897.

[2] 'Travels in Portugal, in the years 1789-1790,' 1 vol. in 4to., with plates. London, 1795.

[3] 'Letters written during a Short Residence in Spain and Portugal,' 1 vol. in 8vo. Bristol, 1797. It ran into three editions, and it is still worth reading.

At the beginning of the last century Link, who probably wrote one of the best books of travel in Portugal, describes the climate of the country as 'mild and healthy.'[1]

A little later, Ruders of Stockholm, a conscientious observer, says: 'The climate of Portugal is praised by everybody,' and notices the fact that 'every year there are many English people who come here for their health.'[2]

In 1815, Sir James Macgrigor, M.D., chief of the medical staff of Wellington's army in the Peninsula, remarks: 'The expatriating phthisical patients to the milder climates, particularly to that of Portugal, has been a highly-sanctioned practice in England.'[3]

And, finally, in 1822, Adrien Balbi, in his most interesting and learned Essay, observes: 'The reputation of Portugal as a health resort is so well established among strangers, especially the English, that the physicians of England are accustomed to send their patients there.'[1]

---

[1] 'Bemerkungen auf eines Reise durch Spanien und vor zugleich Portugal,' 3 vols. in 8vo. Kiel, 1800-1804. (Translated into English and French.) About the same time a small book was published anonymously, entitled 'The Lisbon Guide,' containing directions to invalids who visit Lisbon. London, 1800. It has no value, except so far as it shows that the number of invalids was increasing.

[2] 'Nägra Anmärkningar öfver Portugall,' 1 vol. in 8vo. Stockholm, 1803.

[3] 'Sketch of the Medical History of the British Armies in the Peninsula of Spain and Portugal,' in *Transactions of the Medico-Chirurgical Society*, vol. vi., 1815, p. 441.

The British medical practitioners entertained a favourable opinion regarding the climate of Lisbon until about the middle of the last century, when, owing to rapid communications established by land and by sea in various parts of Europe, especially so with France and Italy, and to the love of novelty which is innate in human nature, other health resorts attracted their attention, and gradually their opinion changed to such an extent that they not only ceased to send their invalids here, but even condemned the climate.

Dr. Francis, writing in 1853, says: 'Lisbon enjoyed a high repute for the beneficial effect of its climate. The neglect into which its claims have at present fallen is probably as undeserved as was their former excessive praise.' And further on he remarks: 'The prevailing character of the climate [of Portugal] is dry and bracing, for during, on an average, nine months nearly of the year the winds come from the north, and during the remaining three months from the south-west. The east winds are unknown. Franzini's observations on the winds, made during a long series of years, gave the following results: The north wind prevailed in 144 days, the north-west in 124, and the south-west in 128. This inconstancy of the character of the climate—the fluctuations between the extremes of dryness and moisture, and the variations of temperature depending on alternate sunshine and rain—is even in ordinary seasons pretty strongly marked in Lisbon.'[1]

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[1] 'Essai statistique sur le royaume de Portugal et d'Algarve, comparé aux autres états de l'Europe,' 2 vols. in 8vo. Paris, 1822.

Sir Hermann Weber countenances these opinions. 'At present,' he says in 1880, 'Lisbon has fallen into oblivion as a health resort, although it is better than many others in vogue.' But he adds: 'The weather in Lisbon varies frequently; it passes very rapidly from humidity to dryness, from cold to heat, sometimes with a violent wind.'[2] And four years later he remarks: 'The western coast of the Iberian Peninsula possesses at present not a single place which can be recommended as a climatic resort to invalids with any degree of confidence.'[3]

These expressions of opinion, coming as they do from one who occupies, very deservedly, the foremost place among climatologists, have been adopted without discrimination by writers of less note, amongst whom one of the most recent is his distinguished son, Dr. Parkes Weber, who, in the Section of Climatology in the 'System of Physiologic Therapeutics,' edited by Dr. Cohen of Philadelphia, says: 'Lisbon is subject to wind and to sudden changes of temperature.'[1]

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[1] 'Change of Climate,' by D. J. T. Francis, M.D. Lond. London, 1853, p. 115.

[2] 'Klimotherapie,' von Dr. H. Weber (London), in 'Handbuch der allgemeinen Therapie,' von Dr. von Ziemssen, vol. ii., part i. Leipzig, 1880, p. 84. It has been translated into English and French.

[3] 'Climate and Health Resorts,' in 'The Book of Health,' edited by Malcolm Morris. London, 1884. In 1891, in the French translation of his monograph, Weber ignores Portugal altogether.

And, lastly, J. Yate Johnson, the author of the article 'Lisbon' in the 'Encyclopædia Britannica,' after giving some meteorological figures, adds: 'Lisbon is subject to frequent and rapid changes of temperature.'

The inference that one would naturally draw from these statements is, that Lisbon has a variable climate; that

(1) Its temperature is subject to rapid changes;
(2) Its humidity is variable; and
(3) Its winds are violent.

Lisbon is, therefore, as regards climate, under the ban of English climatologists of the present generation.

I wish you now to examine the meteorological data, taken from official sources, which I place before you, that you may judge for yourselves whether the opinions advanced by Francis, and adopted, as a matter of fact, by subsequent authors, are based upon correct figures, or whether I am right in claiming for Lisbon a superiority over most of the temperate marine stations of Europe. This question is of great importance, not only regarding Lisbon, but especially in reference to the newly-established winter resort of Mont' Estoril.[1] If Lisbon is variable, it stands to reason that Mont' Estoril and Cintra, which are only 26 and 28 kilometres distant, cannot have an equable climate; it is therefore necessary to fix definitely, from a medical point of view, the climatic character of this city.

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[1] *Vide* vol. iii., book i. London, 1901, p. 131.

In order to show the superiority of the various factors of the climate of Lisbon, I wish to compare them with those of Biarritz, Nice and Càtania—places which have a well-established reputation as health resorts. I have no especial object in selecting these stations in preference to others; I do so merely because they have public meteorological stations, and represent the best types of their class. Biarritz, lately patronized by King Edward VII., is the most popular upon the Atlantic coast of France; Nice is the most frequented on the Mediterranean side; and Catania, situated upon the eastern coast of Sicily and in about the same latitude as Lisbon, claims to be one of the most healthy and temperate health resorts in the continent of Europe.

In trying to re-establish the reputation of the climate of Lisbon, it is not my intention to say a single word in disparagement of the three stations selected for my comparison, for they have their value, in proper seasons and in suitable cases and constitutions, just as Mont' Estoril and Cintra have theirs, although I must say that the large agglomeration of people which occurs at Nice is not conducive to health. In order to show you the absence of any personal bias, I am willing to accept meteorological figures of any other temperate marine winter health resort, and to compare them with those of Lisbon, and more especially with those of Mont' Estoril, and I am convinced that the latter has nothing to fear from any of its rivals. It has to be remarked that it is not fair to judge the climate of a country by that of its capital, for nobody would think of judging the climate of Bournemouth from that of London, or that of Newport from that of New York; nor is it fair to judge a station by one season only, for the winter may be very agreeable and the summer the reverse.

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[1] *Vide* Note C in the Appendix for its history.

It is evident that Biarritz and Nice, which have a cold climate in winter, cannot be compared in every respect with Lisbon or Mont' Estoril, which are temperate; but for every health resort there are some characteristics which are essential, and I wish to show that the former places, including Catania, have a more variable climate than the latter.

1. Temperature.—(*a*) In considering the climate of any given place, its *latitude*, its *altitude*, and its *configuration* are of great importance.

Lisbon, as you are aware, is situated 38° 42′ north latitude, or nearly the same as Palermo or Catania, or about 500 kilometres south of the

Rivieras of France and Italy. Its highest altitude is Campolide, 130 metres. Lately, the limits of the capital have been greatly extended, and the highest point now in this area is Monsanto, 226 metres (546 feet).

Mont' Estoril lies due west of Lisbon, on the shores of the Blue Bay of Cascaes, and is built upon the gentle and undulating slopes of two or three 'montes,' or elevations, facing full south. It is sheltered on the north to some extent by the Serra of Cintra, which is, in a direct line, 11 to 12 kilometres distant, and to a greater extent, in some parts, and completely, in others, by the 'montes'; on the east and west it is protected by the hillocks of Picôto and of Palmella. On the south it is quite exposed, and has an admirably firm, sandy, and particularly clean beach, studded with picturesque rocks. Its highest points are from 78 to 109 metres (234 to 327 feet) ; its soil consists of decomposed granite with a layer of sand, and is porous ; its drainage is good, and the water-supply is pure.

The town of Cintra lies in latitude 38° 47′ north, and to the north-west of Lisbon ; and 16 kilometres, or 9 miles, to the north-east of Mont' Estoril. Its highest elevation is 529 metres, or 1,735 feet, the hotels being placed about midway. It faces due north, and is consequently exposed to the prevailing winds. It is one of the most charming and picturesque stations in the whole of Europe ; it is 'the most blessed spot' of Southey, and 'the glorious Eden' of Byron.

From the latitude of these three places it is evident that they have, naturally, a more temperate climate in winter than all the health resorts of France or on the Gulf of Genoa.

(*b*) The mean *temperature* (Table I.) of Lisbon in December, January, and February, is 10·56°, 10·21°, 11·13° C., as compared with 8·39°, 6·87°, 8·11° C. of Biarritz; 8·24°, 7·36°, 8·12° C. of Nice; and 11·3°, 10·1°, 10·9° C. of Catania. The mean temperature of the four places in winter is, respectively, 10·63°, 7·79°, 7·91°, and 10·8° C.; these figures proving that Lisbon is much more temperate than Biarritz and Nice, and as temperate as Catania and more uniform.

The diurnal variations (Table II.) are still more remarkable: they are, in December, January, and February, in Lisbon, 6·48°, 6·55°, 6·11° C.; at Biarritz, 6·59°, 6·57°, 7·39° C.; at Nice, 10·31°, 9·59°, 10·79° C.; and at Catania, 4·5°, 6·5°, 6·8° C. Lisbon is therefore decidedly more equable than Biarritz and Nice, but less so than Catania in December, and almost equal in January and February, not having the sudden and very noticeable transition of 2° C. between December and January.

What I say regarding winter is applicable to other seasons. There is no month in which the fluctuation of temperature is greater in Lisbon than at Biarritz or Nice, and, compared with Catania, there is greater uniformity of fluctuation from November to April.

From all these facts we can conclude, without a shadow of doubt, that the climate of Lisbon is more equable than that of Biarritz, Nice, or even Catania.

I have no difficulty in proving now to you that Mont' Estoril, from its situation and configuration, has a better and more equable temperature than Lisbon itself. Being situated on the Atlantic coast, it is directly under the influence of the sea and of the Gulf Stream, which divides into two currents at the latitude of Lisbon—the North Atlantic and the North African, while a small offshoot runs, it is said, under very favourable winds up the River Tagus as far as Belem. This current of warm water has a decided influence upon the coasts it bathes. Mont' Estoril is the first place in Europe to be affected by it. The result is that it possesses a particularly equable climate ; the mean temperature is higher, the range of the diurnal variation is lower, and the difference between the sun and shade is remarkably less than in Lisbon. The maxima temperatures at Mont' Estoril in winter are similar to those of Lisbon, but the minima are generally 1° to 3° C. (2° to 4° F.) higher, especially when they go lower than 5° C. in Lisbon. The explanation of this fact is simple. The mean temperature of the Gulf Stream in winter is between 11° and

12° C. (51° to 52° F.),[1] and when the minima temperatures upon the coast or its proximity fall to about 5° C., a local current of wind sets in, and the temperature is rendered, as far as possible, equal. This is so well known among climatologists that I need not explain it further. In summer, when the heat upon land is greater than that of sea-water, opposite conditions occur, and Mont' Estoril becomes cooler than Lisbon. This explains why the residents of Lisbon frequent it so much in summer and in early autumn, when, in addition to a cooler temperature, they have the advantage of excellent and pure sea-bathing, and of the mineral baths[2] of Estoril, so noted for their efficacy in rheumatism and in some other arthritic complaints.

Cintra has a lower temperature and greater humidity than Lisbon. It cannot be recommended in winter, although one medical authority and some guide-books do so—it is like sending people to Buxton or Newport when they should go to

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[1] In the 'Report of the Scientific Results of the Voyage of H.M.S. *Challenger*,' the mean surface temperature of the North Atlantic, between the latitudes of 35° to 40°, is given as 68·18° F., the extreme range being 25·5°. (*Vide* 'Physics,' vol. i.: 'Deep Sea Temperatures,' Table VI.)

[2] The composition of this water is as follows: Chlorides of sodium, 2 grammes, of lime, 0·14, and of magnesium, 0·378; carbonates of lime, 0·204, and of magnesium, 0·278; sulphates of lime, 0·204, and of magnesium, 0·278; silica, 0·04; oxide of iron, 0·004, and organic matter, 0·028. Total solids, 3·57 grammes. The temperature at the source is 28° C., that of the open air being 16° C. The season lasts from May 1 to November 15.

Hastings or Jacksonville. It is a healthy and charming station in summer: its height, its dense vegetation, and its exposure to the north, reduce its mean temperature by 5° to 6° C. (10° F.) below that of Lisbon, and make it a suitable residence to those content with a mean of 16° C. (61° F.) No capital in Europe, other than Lisbon, has the advantage of so charming a residence of moderate altitude in summer within half an hour's reach.

(*c*) The number of days of *frost* (Table VII.) in Lisbon during winter averages 2·2; at Mont' Estoril it has been observed only once during the last five years, but at Cintra it is naturally more frequent.

(*d*) *Snow* is unknown in Lisbon or at Mont' Estoril, and there is very little, if any, at Cintra. The nearest place where it is found to lie for some days is Monte Junto, 666 metres high, 55 kilometres from Lisbon; then, for two or three months, at the Serra of Louză, 1,262 metres high and 165 kilometres distant; and for about six months at Serra d'Estrella, 1,993 metres high, the greatest elevation in Portugal, and 210 kilometres distant. All these heights are to the north-north-east of Lisbon.

2. HUMIDITY.—(*a*) Table III. shows that the *relative humidity* of Lisbon is 79·1, 79·2, 75·3 in December, January, and February respectively,

while that of Biarritz is 73·6, 75·7, 73·3; of Nice, 74·7, 75·1, 74·6; and of Catania, 70·7, 67·0, 66·3.

Weber classifies climates as follows: Very dry when the relative humidity is from 0 to 55; moderately dry, 55 to 75; moderately moist, 75 to 90; and very moist, 90 to 100. Lisbon, with its mean of 77·8 in winter, is moderately moist, and is but 3 per cent. above the utmost limit of moderately dry. The mean relative humidity at Biarritz, Nice, and Catania is 74·2, 74·8, 68·0 respectively, in winter, thus falling under the class 'moderately dry.' The variation between Biarritz or Nice and Lisbon is 4 per cent., and between Catania and Lisbon 8 per cent.

The humidity of Lisbon is uniform in December and January, and 4 per cent. less in February. According to Professor Jaccoud it is between 70 and 80 that we must search for the desirable relative humidity, and Lisbon stands well within these limits in winter, and also in the months of March, April, October, and November.

Mont' Estoril, due to its higher temperature, to its situation on the northern side of the Bay of Cascaes, has a relative humidity less than Lisbon. I cannot give exact figures, but can confirm the fact from personal sensation, and from the circumstance that, while the air is quite clear at Mont' Estoril, there is often a haze past the bar of the Tagus. Any humidity that naturally rises from the sea is, owing to the prevailing northerly winds, blown to the south side of the bay, which renders Mont' Estoril a *weak* marine station in winter.

Cintra, owing to its dense vegetation and exposure to the north, is much more damp in winter than Lisbon—in fact, it is moist; but this defect becomes a positive advantage in summer, when all the surrounding country becomes very dry.

(*b*) The *rainfall* (Table IV.) in Lisbon, in winter, is 277·3 millimetres (11·0 inches) against 254·0 of Biarritz, 167·9 of Nice, and 239·2 of Catania. Lisbon has more than any; but it has to be noticed that it is registered here by the most perfect self-registering rain-gauge known, and it has to be seen what kind of registering apparatus is used elsewhere, for, if it is not self-registering, the comparison would be unfair. But, admitting the figures as they stand, the temperature of Lisbon being more than 20 per cent. higher than that of Biarritz or Nice, and, according to the rule that the hotter the climate the more rapid is the rainfall, the fall in Lisbon would not last longer than at these stations. The number of rainy days in Lisbon averages in winter 50·2, out of which 10·4 are less than 1 millimetre daily ($\frac{1}{25}$ inch). There are no data available to compare these with Biarritz, Nice or Catania, but my belief is that they vary little.

The rainfall at Mont' Estoril is less than Lisbon. The remark made above regarding the different rain-gauges used was well exemplified last winter, when I tried to register the rainfall at Mont' Estoril with an ordinary bottle rain-gauge. I noticed that when 1 to 5 millimetres were registered in Lisbon my bottle was quite dry. This was due partly because there was no rain, and partly because, when it was slight, my bottle absorbed it all. The less amount of rain at Mont' Estoril is easily explained. The largest fall of rain occurs with south-south-west, south-west, and west-south-west winds, and Mont' Estoril is quite exposed to the sea, and is not sufficiently high to condense the clouds ; while at Lisbon similar clouds are intercepted by the Serras of Arrabida and of Palmella, 499 metres, or 1,300 feet, high, and 20 kilometres to the south. Often, when the sky at Mont' Estoril is clear, heavy clouds hang over Lisbon. I have noticed that it rains more often during the night than the day, and the number of days an invalid is prevented from taking morning and afternoon walks does not exceed ten during the whole winter. A shower of rain will not prevent outdoor exercise, for, as soon as it ceases, the drainage and absorption, owing to the slopes and looseness of the soil, are so rapid that it is easy to start for a walk immediately after.

The rain at Cintra is much more than at Lisbon ; the clouds proceeding from Mont' Estoril are intercepted and condensed there.

(*c*) *Mist.*—In Lisbon the days with mist, in winter, average 11·8 (Table VII.), at Mont' Estoril about 4 to 5, and, at Cintra, several. In summer there is often at the last-mentioned place a dense mist at the foot of the hill in the morning, rising as the day advances and hovering on the top in the afternoon.

3. WINDS.—It is not easy to compare the winds of one place with those of another unless the instruments used be of one and the same pattern, and unless the places selected for observation be equally exposed.

Lisbon has the reputation of being subject to violent winds, quite undeserved if applied to the seasons during which it is visited by foreigners—viz., winter, early spring, and late autumn. All who have resided at Biarritz know that it is particularly subject to winds from the north ; Nice has its well-known mistral ; and Catania its cold wind blowing from the snow-covered heights of Etna.

Table V. shows the prevalence of wind in Lisbon reported with extreme minuteness. I have not been able to obtain similar information regarding Biarritz, Nice or Catania. The four most frequent winds, in winter, in Lisbon are from the N. 220·1 hours, N.N.E. 175·5, N.N.W. 100, and N.W. 71·6 ; while the most rare are S.S.E. 10·5, S.E. 12·8, E.S.E. 17·3, and E. 18·4. The northerly winds are more or less under the influence of the sea, excepting the north-north-east, which, when moderate, are very agreeable and bracing.

Table VI. shows the number of days of wind classified under six headings : Very weak, weak, moderate, fresh, strong, and very strong or tempestuous. In winter the respective numbers in Lisbon are 5, 20, 39, 16, 8, and 3; in spring, 0, 6, 49, 24, 9, and 4; in summer, 0, 5, 39, 38, 10, and 0; and in autumn, 3, 12, 50, 17, 7, and 2. The most common in winter are moderate (41) and weak (20), while in summer the moderate (39) are almost equalled by the fresh (38). The winds in winter are therefore much milder than in summer, for the three weaker winds in winter number 64 days and the three stronger 27, while the respective figures in summer are 44, 48, in spring 55, 37, and in autumn 75, 26. The explanation of these facts is that the deserts in Africa get very hot in summer, and a current of wind sets in in that direction; while in winter, the temperature there not being so high, there is no strong current of wind from the north. Early spring and late autumn have moderate winds like winter. It has to be further noticed that winds of the stronger kind occur, like rain, mostly during the night in winter, and mostly during the day in summer. The number of days of strong wind in winter is but 8, and of violent 3. I believe other places cannot claim so few days of strong and violent winds.

Francis says that the south-west wind, which is relaxing, prevails during 138 days, and that it is the prevalent wind in winter. On referring to Table V. it will be seen that the south-west wind is never prevalent in any month. The most prevalent winds are north in all the months except from April to July, in which they are north-north-west. In winter the south-west blows (mean for 20 years) only during 84 hours, or 3½ days. If we add to it also the south-south-west and the west-south-west, the total does not exceed 8 days and 3 hours. Dr. Francis received his statistics of winds from Franzini, and based his inferences regarding temperature and humidity upon them. Now, it is a well-known fact that the meteorological observations made before about the middle of the last century, in Portugal and elsewhere, are not quite trustworthy. Those who write upon the climate of Portugal should consult the recent and more correct observations. Francis cannot be held responsible for his figures, for he got the best information available at his time, and based his inferences upon them.

One of the reasons why Lisbon has a reputation for winds is that the residents here complain bitterly when there is any slight change of weather, while a person coming from higher latitudes does not notice it at all. Franzini himself, as we know from his writings, went about the streets of Lisbon, in winter, in a fur-lined coat, as many others do at the present day; while it is not rare to see an Englishman take at the same time his daily plunge in the cold water of the Bay of Cascaes. These facts may be thus explained. An individual residing in a very temperate climate, whether in Portugal or elsewhere, has his sensitive nerves neither very strong nor very relaxed; they are, as it were, in an intermediate condition, subject to be influenced by any slight change of temperature, and attuned more to the poetic, romantic, and artistic[1] side of life, than to the prosaic, practical and industrial of the north, or to the philosophic and mystical of the south. Idiosyncrasies apart, persons residing in the north or in the altitudes of the Beiras, can bear heat and also cold much better than those in the temperate regions ; and so also a resident in the south or in the tropics can bear, comparatively speaking, more cold than more heat, for the former braces him, while the latter relaxes him still more. Many believe that a resident of the tropics can bear heat better than one from the cold regions. This is a fallacy, for the heat does not inure a person to stand more heat, but cold does. An Englishman, for instance, never carries a sunshade in Portugal or Italy, while many natives of those countries do.

Another reason, is the disposition of its principal streets : the Avenida da Liberdade and all the main streets in the Baixa, for instance, run from north to south, and are therefore exposed to the prevalent winds. So are exposed the tops of the seven hills of which the 'small' city is composed. There are, however, many places upon the slopes towards the Tagus which are well sheltered. The favourite quarter of the invalids at the commencement of the last century was Buenos Aires.

Wind by itself, except when strong or violent, has no injurious effect, provided it does not cause sudden variations of temperature or humidity, and we have already seen this is not the case, especially in winter. Many persons bear fresh winds with ease.

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[1] *Vide* Note D in the Appendix.

Mont' Estoril is not so subject to winds because it is sheltered, to some extent, as already mentioned above, by the Serra of Cintra and, more so, by the 'montes' of Estoril. The seashore is entirely protected, and so also, to a large extent, is the road leading to Bicesse, and the others running from east to west, so that it is always easy to remain in the open air.

Cintra is a town built for summer residence. In this season, wind is not felt so much there as in the plains, for the first gusts form, as it were, a mass of compressed air against the hill, and the succeeding gusts, passing over this mass, leave the place comparatively sheltered. This is one of the reasons why it stands in such favour in summer. It accounts also for its luxuriant vegetation.

From all these facts it is quite clear that the opinion that Lisbon is subject to violent winds in winter, spring and autumn, is erroneous; that Mont' Estoril is well sheltered in winter; and that Cintra also 'protects' itself in summer.

4. OTHER CLIMATIC FACTORS (Table VII.)—(*a*) *Air and Ozone.*—The air of a city like Lisbon cannot be very pure: some of its elevated parts are fairly good but subject to wind; some outlying

localities, as Bemfica and Belem, are satisfactory, but there are no hotels there. The amount of ozone in the air is 5·88; this figure is not of much significance, as the quantities are estimated by the paper-test.

The air of Mont' Estoril is very pure, marine, and healthy; it is rendered still more wholesome by the forests of pine and groves of eucalyptus, which, it is well known, have the property of increasing the amount of ozone in the air. During winter there is no traffic, no motor-cars, no dust.

Cintra in summer has a pure air tempered by the moisture exhaled by its abundant vegetation; the ozone there is naturally greater than in Lisbon.

(*b*) *Atmospheric Pressure.*—The mean for the year in Lisbon is 755·25, against Biarritz, 665, and Catania, 762·9. The lowest pressure is observed in March (753·93), and the highest in January (757·41), the difference being 3·48. At Biarritz, the difference is 6, and, at Catania, 3·5. No data are available for Nice.

Mont' Estoril has a somewhat higher, and Cintra, owing to its height, a lower atmospheric pressure than Lisbon.

(*c*) *Nebulosity.*—The amount in Lisbon in winter is 5·18. From the explanation given under the heading of Rainfall regarding the situation of the Serras of Arrabida and of Palmella and of the exposure of Mont' Estoril, it is evident that the nebulosity at Mont' Estoril is less; while that of Cintra, owing to its elevation, is more than that of Lisbon.

(*d*) *Luminosity.*—No data are available under this heading regarding Nice or Biarritz. Lisbon registers 114 hours 28 minutes of sunshine in December, 108 hours 44 minutes in January, and 171 hours 28 minutes in February, while Catania has 95, 157, and 150 hours, or a total of 402 against 396 of Lisbon. All these figures are for one year only for each place. It has been said that for a good health resort at least two out of three days should have sunshine. Both Mont' Estoril and Lisbon more than satisfy this condition in winter.

From all these facts we may safely conclude:

1. That Lisbon has (*a*) a temperature much milder and more equable than Biarritz or Nice, and as mild and more uniform than Catania; (*b*) that its relative humidity stands as 'desirable'; and (*c*) that the prevailing winds are moderate. With all these advantages, and with those noticed under the heading of Other Climatic Factors, so large a city can never be a health resort; but it can be recommended to those who wish to have a simple holiday, combining the pleasures of a very gay city with a very mild climate.

2. That Mont' Estoril is far superior in every respect to Lisbon, and, consequently, much more

so to Biarritz, Nice or Catania. In fact, having searched in every part of Western and in some parts of Southern Europe for a good climate for my own residence, I have not found yet any place that can stand comparison with Mont' Estoril, from November to March, for its purity of air, equable temperature, comparative dryness, and immunity from winds. If we add to it the advantages derived from its forests of pine, its avenues of palms and groves of eucalyptus, its beautiful villas and good hotels, its excellent system of drainage and pure, soft and wholesome water-supply, its magnificent and firm sandy beach, its numerous walks, its boating and sea-fishing, its luxuriant tropical vegetation and the marvellous profusion of indigenous and exotic flowers, its orange-groves laden with golden fruit, and the blue sky and the blue sea, we have a spot of beauty and salubrity second to none —a garden, indeed, of full spring—when England is enshrouded in gloom, mist, frost, and snow. For its accessibility by sea from London, from New York, and from Rio de Janeiro, and from its proximity to a large, gay, and hospitable city like Lisbon, it has no rival. From one of the photographs[1] I hand round you will see how the mimosas were in full bloom on January 15 last.

3. That Cintra is a charming station of moderate altitude, moderate temperature, and agreeable mois-

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[1] I regret that I am unable to reproduce these views, as they would enhance greatly the cost of this pamphlet.

ture in summer. It has remarkable points of historical interest: The 'Paço de Cintra' or the Royal Palace; the picturesque Castle of Pena, and the ruins of the Moorish castle; the Penha Verde, formerly the residence of Don João de Castro, with its chapel built on his return from India; the convent of Santa Cruz or the Cork Convent; Monserrate, and many others. Its tropical vegetation when all around is dry, its tree-ferns and camellias, its palaces, its splendid villas, render it an excellent health resort for those content with a mean temperature of 16° C. (61° F.). 'I do not know,' says Southey, 'how to describe to you the strange beauties of Cintra. It is, perhaps, more beautiful than sublime, more grotesque than beautiful, and yet I never beheld scenery more calculated to fill the beholder with admiration and delight. Had I been born at Cintra, methinks no inducement could have tempted me to leave its delightful springs and shades.' And we all know that beauty and harmony conduce greatly to repose of mind, and consequently to health. The capabilities of Cintra as a health resort have not yet been fully utilized. By selecting a suitable site on the southern aspect of the Serra, a winter station could be founded which would be superior in several respects to many resorts of moderate altitude in Switzerland. This subject is well worth attention.

Medically speaking, the climate of Mont' Estoril may be classified as intermediate between tonic and stimulant on the one hand, and tonic and sedative on the other. It partakes, in suitable cases and constitutions, the qualities of both. It acts as a stimulant in cases of debility arising from fevers or lung complaints, in infantile wasting, in senile debility, and in some forms of dyspepsia; it acts as a sedative in most cases of asthma, insomnia and nervous irritability; while its equable temperature and comparative dryness are extremely beneficial in chronic rheumatism and gout, and in most of the chronic catarrhs of the lungs. Its action may be compared, if I may be permitted a homely simile, to that of a good glass of port wine, which acts as a stimulant in some cases, as a sedative in others, while it has hardly any effect on the robust and strong. These remarks may also be applied to Cintra in summer.

Mont' Estoril is an ideal place for rest and repose, especially to those who have overworked themselves, for there they will sleep better than at most other places. It is also an excellent intermediate station for persons returning from the tropics, who wish to avoid the rigours of a cold winter in the North; or for those who are ill, and to whom a sudden change from great heat to great cold would be extremely dangerous. It can be recommended, too, to those few people who cannot stand artificially heated rooms; for at Mont' Estoril there is no need for a fire nor for warm clothing. Some cases of tuberculosis of the lungs, in its initial stage, would doubtless be benefited by it, but they will not find accommodation there, as both hotel and villa proprietors decline to receive them.

You see, Gentlemen, I do not believe Mont' Estoril to be a panacea for all diseases, nor do I recommend it in all seasons. The healthy, the strong, and those who require a very sedative or a very stimulant climate, will be better elsewhere. Portugal has places with climates of almost every description and for every season, but some of them require improved accommodation, and others remain yet unexplored. All I claim for Mont' Estoril is that it has no rival as a health resort of its class from November 15 to March 15. I have no interest there, direct or indirect, of any kind whatsoever. I retired from the profession six years ago. My only interest is scientific, for it was my privilege to bring it first to the notice of the profession in the columns of the *Lancet* two years ago as a *winter health resort*, and to christen the shores of the Blue Bay of Cascaes 'The Riviera of Portugal,' a name that has been widely adopted. Naturally, I take great interest in its development, and I am glad to see that it is already attracting attention, professionally and commercially, in Great Britain and in the United States. I recommend you all, Gentlemen, to see this delightful and privileged spot, this Nature's paradise of pure air and lovely flowers, before you leave Lisbon.

In conclusion, I wish to express my indebtedness to Sr. Ferrugento Gonçalves, the able and obliging First Recorder of the Infante Dom Luis Observatory, for his help in the preparation of the meteorological tables, and to render you, Gentlemen, my thanks for your kind interest in my communication. My best thanks are also due to the distinguished climatologists and hygienists, members of this Congress, who have already been pleased, at my invitation, to visit Mont' Estoril, and to verify for themselves its sanitary condition and its capabilities as a winter health resort.

Mont' Estoril,
April 24, 1906.

N.B.—Mr. Jackson, F.R.C.S. Eng., one of the elected members of the General Medical Council, who took great interest in the climate of Mont' Estoril, was pleased to ask for further information on the drainage, water-supply, and hotel accommodation. He wanted to know also why the hotel proprietors refused to admit consumptives. I have given replies to his questions in Notes A and B of the Appendix.

TABLE I.—TEMPERATURE.

MONTHLY, SEASONAL AND ANNUAL MEAN.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Winter.	Spring.	Summer.	Autumn.	Annual.
Lisbon[1]	10·4	11·13	12·49	14·25	16·40	19·25	21·24	21·60	19·95	16·66	13·57	10·56	10·63	14·38	20·69	16·69	15·63
Biarritz[2]	6·87	8·11	9·91	12·32	14·95	18·50	19·91	20·86	19·38	15·09	11·28	8·39	7·79	12·39	19·67	15·25	13·80
Nice[2] ...	7·36	8·12	10·21	13·17	16·44	20·43	22·97	22·41	20·20	15·46	11·71	8·24	7·91	13·27	21·94	15·79	14·75
Catania[3]	10·1	10·9	12·2	14·9	18·0	22·7	26·1	26·6	20·5	19·5	14·9	11·3	10·8	15·0	25·1	19·3	17·6

[1] All the figures in this and the following tables are, except where otherwise stated, prepared by Sr. Ferrugento Gonçalves, of the Lisbon Meteorological Observatory, and published in the *Guide Médical de Lisbonne*. They are the mean for forty-three years—from 1856 to 1900.

[2] From the 'Bureau Central Météorologique de France' (*cit.* Lalesque).

[3] Mean from 1875 to 1900, from 'Risultati delle Osservazioni Meteorologiche,' by Professors A. Riccó and F. Eredia.

TABLE II.—TEMPERATURE.

DIURNAL AND ANNUAL FLUCTUATION.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Mean.	Annual Fluct.
Lisbon	6·55	6·11	6·46	6·74	7·49	8·04	8·90	9·08	8·74	6·49	5·72	5·48	6·96	19·29
Biarritz	6·57	7·39	7·98	7·45	7·46	7·36	8·09	7·82	7·76	7·46	6·68	6·59	7·50	13·99
Nice	6·69	10·79	10·87	11·06	11·17	11·39	11·87	11·83	11·54	10·99	9·84	10·31	10·18	15·61
Catania[1]	6·5	6·8	7·4	7·5	7·0	7·4	7·6	7·7	6·5	6·6	6·2	4·5	6·8	20·5

[1] For 1900 only.

TABLE III.—RELATIVE HUMIDITY.

MONTHLY, SEASONAL AND ANNUAL MEAN.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Winter.	Spring.	Summer.	Autumn.	Annual.
Lisbon	79·2	75·3	71·0	70·6	68·4	61·1	62·5	61·8	67·2	72·6	77·6	79·1	77·8	70·0	61·8	72·4	70·88
Biarritz	75·7	73·3	71·6	74·1	74·5	77·9	76·8	78·1	75·9	73·2	73·7	73·6	74·2	73·4	77·6	74·3	74·9
Nice ...	75·1	74·6	75·6	73·0	76·2	76·5	75·2	73·2	74·7	79·9	81·1	74·7	74·8	74·9	78·6	78·6	75·8
Catania[1]	67·0	66·3	64·0	63·0	58·2	52·5	49·5	55·5	57·7	66·2	72·0	70·7	68·0	61·7	52·5	65·3	61·9

[1] Mean for 1892-1900.

TABLE IV.—RAINFALL.

MONTHLY, SEASONAL AND ANNUAL.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Winter.	Spring.	Summer.	Autumn.	Annual.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Lisbon	94·3	86·7	89·5	69·4	52·3	16·1	3·0	8·1	31·9	84·0	106·5	96·3	277·3	211·2	27·2	222·4	738·3
Biarritz	90·8	66·0	81·6	86·2	69·4	79·4	65·4	84·1	73·3	151·9	122·1	97·2	254·0	237·2	228·9	347·3	1067·4
Nice ...	50·7	47·2	84·7	72·3	64·8	28·7	32·8	13·3	42·4	145·8	114·2	70·0	167·9	221·8	74·8	302·4	766·9
Catania[1]	60·1	54·3	50·9	38·1	21·2	6·7	1·0	17·1	20·9	52·8	113·2	119·8	234·2	110·2	24·8	186·9	556·1

[1] 1892-1900.

TABLE V.—WINDS.

Number of Hours during each Month of the various Directions of the Wind, according to the Table prepared by J. Capello, for the Years 1856-1875.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Winter.	Spring.	Summer.	Autumn.	Annual.
N. ...	73·3	68·3	72·2	57·1	59·7	82·9	104·8	102·4	72·6	81·2	63·6	89·5	220·1	189·0	290·6	212·4	926·6
N.N.E. ...	56·0	43·9	39·6	25·6	12·7	15·6	11·2	13·8	15·9	29·5	52·2	75·6	175·5	77·9	40·6	97·6	391·6
N.E. ...	21·3	21·4	19·4	12·8	11·0	9·7	4·8	7·3	10·6	17·8	31·0	27·4	70·1	43·2	21·8	59·4	194·5
E.N.E. ...	6·4	8·8	6·8	6·2	5·3	4·0	3·3	2·8	5·5	6·0	8·9	7·8	23·0	18·3	10·1	20·4	71·8
E. ...	5·3	6·3	5·0	3·9	4·3	2·0	1·0	1·5	2·7	4·6	6·1	6·8	18·4	13·2	4·5	13·4	49·5
E.S.E. ...	5·2	6·5	7·0	4·7	2·5	1·0	1·0	1·0	2·4	4·7	9·1	5·6	17·3	14·2	3·3	16·2	51·0
S.E. ...	4·2	5·1	2·6	1·6	1·2	0·8	0·6	0·5	1·8	3·1	4·4	3·5	12·8	5·4	1·9	8·9	29·4
S.S.E. ...	3·3	4·5	3·5	2·2	2·1	0·6	0·2	1·1	1·9	3·3	3·9	2·7	10·5	7·8	1·9	9·1	29·3
S. ...	15·5	12·5	9·2	10·6	10·4	4·4	2·0	2·5	12·0	15·6	15·4	11·4	39·4	30·2	8·9	43·0	121·5
S.S.W. ...	25·6	23·7	23·6	21·7	27·2	13·5	9·4	9·1	21·7	27·1	25·0	19·3	68·6	62·5	32·0	73·8	246·9
S.W. ...	28·1	30·9	29·6	35·5	42·5	34·6	25·4	26·4	38·8	39·0	24·8	25·0	84·0	107·6	86·4	102·6	380·6
W.S.W. ...	23·1	15·3	25·8	29·7	24·8	25·7	18·5	23·6	29·3	24·6	20·0	17·3	55·7	80·3	67·8	73·9	277·7
W. ...	15·7	13·1	13·5	16·2	16·3	12·4	9·4	9·7	14·4	13·4	12·6	8·1	36·9	46·0	31·5	40·0	154·8
W.N.W....	17·8	16·8	17·9	25·5	20·6	17·8	13·7	13·1	20·6	14·4	16·4	11·7	46·3	64·0	44·6	51·4	206·3
N.W. ...	25·8	22·1	32·7	41·8	42·8	40·4	47·3	39·8	31·2	29·6	22·9	23·7	71·6	117·3	127·5	83·7	400·1
N.N.W....	37·4	32·7	58·8	59·7	82·2	88·5	114·0	109·8	70·3	49·0	38·0	29·9	100·0	200·7	312·3	157·3	770·3
Variable...	1·8	1·8	2·0	2·5	2·3	2·4	2·2	3·5	2·2	2·3	1·7	1·8	5·4	6·8	8·1	6·2	26·5
Calm ...	6·9	4·8	2·5	2·3	3·6	2·9	2·6	3·8	5·8	6·1	3·5	4·5	16·2	8·2	7·3	15·4	49·3
Prevalent wind ...	N.	N.	N.	N.N.W.	N.N.W.	N.N.W.	N.N.W.	N.	N.	N.	N.	N.			N.N.W.	N.	N.

TABLE VI.—WINDS.

Number of Days with Weak, Very Weak, etc., Winds, from the Meteorological Report for 1903.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Winter.	Spring.	Summer.	Autumn.	Annual.
Very weak	3	0	0	0	0	0	0	0	0	1	2	2	5	0	0	3	8
Weak	8	6	2	2	2	2	1	2	5	2	5	6	20	6	5	12	43
Moderate	16	15	18	14	17	12	12	15	11	21	18	8	39	49	39	50	177
Fresh	3	5	5	10	9	12	15	11	9	5	3	8	16	24	38	17	95
Strong	1	2	4	3	2	4	0	3	4	2	1	5	8	9	10	7	34
Very strong	0	1	2	1	1	0	0	0	1	0	1	2	3	4	0	2	9

TABLE VII.—BAROMETRIC PRESSURE AND OTHER CLIMATIC FACTORS.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Winter.	Spring.	Summer.	Autumn.	Annual.
Barometric pressure	mm. 757·41	mm. 756·52	mm. 753·93	mm. 753·97	mm. 753·84	mm. 755·37	mm. 755·30	mm. 754·82	mm. 755·11	mm. 754·57	mm. 755·08	mm. 757·15	mm. 757·02	mm. 753·79	mm. 755·16	mm. 755·25	mm. 755·25
Number of days with rain	14·1	12·4	13·2	12·4	10·1	5·3	2·0	2·2	7·1	11·8	13·4	13·3	39·8	35·7	9·5	32·3	117·2
Number of days with less than 1 mm. ...	3·8	3·0	3·1	4·1	3·2	2·1	1·4	1·0	2·6	3·4	3·0	3·6	10·4	10·4	4·5	9·0	34·2
Number of days of frost	0·7	0·8	1·0	0·7	0·3	0·0	0·0	0·1	0·1	0·1	0·4	0·7	2·2	2·0	0·1	0·6	4·9
Number of days with mist	4·2	2·8	1·3	0·4	0·2	0·2	0·2	0·4	0·9	2·1	3·4	4·8	11·8	1·9	1·0	6·4	20·9
Nebulosity	5·40	5·13	5·11	5·22	4·60	3·45	2·04	2·08	3·63	4·94	5·33	5·22	5·15	4·97	2·52	4·60	4·34
Ozone	5·92	5·98	5·94	5·86	5·40	4·68	3·94	4·04	4·51	5·01	5·46	5·76	5·88	5·75	4·22	5·34	5·21
Number of days with thunder	1·1	0·9	0·9	1·2	2·0	1·2	0·3	0·3	1·8	1·8	1·5	1·0	3·0	4·1	1·8	5·1	14·0
Number of hours with sunshine[1]	108·44	171·38	188·46	242·15	216·19	261·3	321·48	332·13	242·7	196·4	165·54	114·28	394·50	647·20	915·31	605·18	2161·29

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[1] From the Report of the Meteorological Observatory for 1903.

APPENDIX

A.—Water-supply, Hotels and Drainage

1. *Water-supply.*—Mont' Estoril obtains its water-supply from two springs at Cintra, one of which belongs to the Mont' Estoril Company and the other, well known as the Valle de Cavallos, to Sr. Anjos. The water in both the services is conveyed to Mont' Estoril in covered conduits, and stored in covered reservoirs. The Company supplies the Grand Hotel and the eastern part of the station, and Sr. Anjos the Grand Hotel d'Italie and all the houses lying to the west of it, as well as St. John of Estoril. The water of both the springs is pure and abundant in winter; that of the Valle de Cavallos is very soft, and is so much valued that it is bottled at the source and sold in Lisbon.

2. *Hotels.*—The Grand Hotel, a substantial and symmetrical building opened in 1897, affords accommodation for seventy beds, with about fifteen rooms facing the south. Judging from its balcony and general design, it is evident that it was meant to be used chiefly in summer.

The Grand Hotel d'Italie, a large oblong building opened in 1900 and enlarged to double its size in 1905, has one hundred and twenty beds, with about thirty-five rooms facing the south. It has a well-laid-out garden, sheltered on the north, and a very soft water-supply ; it possesses a reputation for excellent cooking ; and its balcony faces the south.

If the number of visitors goes on increasing in the same ratio as it did last year, the accommodation will soon become insufficient. In the winter of 1903-1904 there were practically no English visitors at Mont' Estoril; in 1904-1905 the mean daily number was about fifteen, and last year it rose to thirty. It is certain, however, that, should there be a great demand for more accommodation, it would be forthcoming in a comparatively short time. There is already a plan for converting the old Casino into an hotel, and an excellent site has been reserved for a large hotel at Cascaes. There is a good house, the Hôtel de Paris, at Estoril. The new International Casino has an excellently situated restaurant, which is open during the summer and, on holidays, in winter.

There are several villas to be let, especially in winter, the rents varying from £40 to £150 for the season.

3. *Drainage.*—The main drain is carried out to sea, but not far enough away, so that with the ebb tide the outlet is exposed. Since I read this paper, this matter has received the attention of the authorities, and I am assured that the defect will soon be remedied. The soil pipes are trapped and ventilated. The main sewer is also ventilated.

As far as the drainage and water-supply are concerned, the English visitors to all parts of Europe would render good service to the travelling public if in writing for the tariff of hotels they would, at the same time, ask for a certificate guaranteeing the purity of the water-supply and the proper sanitary arrangements of every place they intend visiting. At the outset, as it happened in the case of bathrooms, the replies, in many cases, would be that they had no such certificates, but gradually, in one way or another, the required documents would be forthcoming. The municipalities would be compelled to improve their sanitary arrangements for fear of losing their visitors. The medical practitioners in all countries are most anxious for improved sanitation, but they are helpless unless backed by the public. I write strongly on the subject, for I myself have been a sufferer from bad sanitation at one of the most fashionable watering-places in Western Europe; and, again, on another occasion, at a much frequented winter resort, I had to change my residence owing to the highly defective drains of a hotel which bears a very pompous name. There is no doubt that in both these cases many other visitors must have suffered, and perhaps suffer still now, from defective sanitary arrangements. In these days of International Congresses it is worth while taking into consideration, whether international commissions could not be appointed to examine and report upon those resorts which may be considered to be more or less international.

B.—LAW RELATING TO CONSUMPTIVES.

In Portugal, consumption has always been regarded as an infectious disease, both by the medical profession and by the public at large. Long before Koch's bacillus was discovered, the bedding and clothing belonging to a consumptive were often burnt after his death, and the room occupied by him, if he belonged to a well-to-do family, closed for many years, and, in rare cases, never after occupied. No difficulty was, therefore, experienced in passing the very salutary and perhaps very stringent law[1] of August 30, 1902.

According to article 7, if any consumptive, or anybody supposed to suffer from consumption, changes his room, leaves his hotel, or dies, the proprietor of the hotel or of the boarding-house is bound, under penalty of a heavy fine, to give immediate notice to the Government authorities, and to have the room or rooms disinfected. The expenses in carrying out the sanitary measure have first to be defrayed by the hotel-keeper, who will subsequently be reimbursed by the guest or by the relatives. The proprietor is further required to keep special linen and special crockery for the exclusive use of consumptives. It is no wonder that he refuses to accept those who are, or are supposed to be, suffering from consumption. Moreover, if he were known to accept such guests, the Portuguese would soon cease to frequent his hotel. I think, however, there is great need for a small and properly appointed sanatorium for paying patients. I have known a very hard case in which the daughter of a Portuguese General found it impossible to get any accommodation at Mont' Estoril, and had to go to Madeira.

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[1] *Vide* 'Boletim do Governo,' 1902, No. 198.

C.—Historical Note.

Mont' Estoril belongs to the parish of Cascaes. Its very name and that of St. John of Estoril were hardly known twenty years ago. They are the offshoots of Estoril, which is a much older place.

The history of Mont' Estoril dates from the opening of the railway from Lisbon to Cascaes in 1889. About the same time, it was decided to start a sea-bathing or summer station on the low range of hills of Estoril, which was given the name of Mont' Estoril. A Company was formed, which laid out and made excellent roads, built drains on the modern system, brought water in covered conduits, and constructed four villas and a hotel to be let. Medically speaking, its directors deserve great credit for their drainage system, which is considered to be the best in Portugal. It would be highly desirable that the new residential buildings, fast springing up along the Riviera, followed their example.

The salubrity of the Riviera of Portugal has been known for ages. The monks, excellent judges of a genial climate and of good cheer, selected Estoril and Cascaes for their monasteries. In 1527 the

Franciscans built one at the former place, with a church dedicated to St. Antony; and in 1597 the Carmelites installed themselves in another at Cascaes, which was founded and endowed by the Countess of Monsanto, Dona Ignez Pimentel de Castro, and stood near the Church of the Assumption, not far from the Château of Cascaes.

Estoril, as already alluded to above, has been known for a long time. Its mineral waters were made use of by King Joseph about 150 years ago; but their extended use and the general prosperity of the municipal district of Cascaes were greatly retarded for want of good roads. It was only in 1864 that a good road was made connecting Cascaes with Lisbon, and, in 1868, another connecting Cascaes with Cintra. But the real impetus was given by the railway, which, with its frequent and rapid service, enabled many well-to-do Lisbon merchants and other men of business, to reside permanently along the whole line of the Riviera, from Carcavellos to Cascaes.

Mont' Estoril was designed mainly as a sea-bathing or summer resort, and consequently the houses for the most part were only built as summer residences. It has only been utilized as a winter resort during the last two years. There is not the slightest doubt but that Mont' Estoril is, in respect of climate, at its best in winter.

The Dowager Queen, Dona Maria Pia, deserves great credit for having been first in the field to lead the way to the Riviera, for it was she who, in the early seventies, long before the opening of the railway, took her two sons, the present King Dom Carlos and his brother Dom Affonso, there for a change of air, after an attack of measles. This set the fashion. She has now selected a far more picturesque place at Mont' Estoril, where she resides with Dom Affonso in autumn and sometimes in winter. Her villa commands one of the most beautiful views of the Blue Bay of Cascaes. She is a great believer in the climate of Mont' Estoril, as is evident from the fact that, whenever she does not feel well, she goes to pass a few days there.

The first house at Mont' Estoril dates from 1870; it was built by Sr. Torresão, on the rise to the west of St. Antony's Church, and was known as 'the house in the woods.' A little later on the Duchess of Palmella built her cottage in the Elizabethan style near the crossing of the railway, on the road to Cascaes, and laid out her beautiful park, which is open to the public only during the season.

Cascaes has an ancient and much more interesting and thrilling history. The Phœnicians, the Carthaginians, the Romans, and the Moors, all must have known the place, both as a fishing-station and as a point of strategical importance. The Moors, specially, who had a fortified castle at Cintra, must have taken care not to leave such an accessible bay as that of Cascaes undefended.

Since the foundation of Portugal as a distinct and independent kingdom, the history of Cascaes and of its fortress represents, in many respects, the different phases of the history of the whole nation. I will only refer here very briefly to the most important dates and bare facts.

The municipal district of Cascaes consists of four parishes—Cascaes, Alcabideche, St. Domingos, and Carcavellos. Its Municipal Chamber has had for its President, for several years, Sr. Costa Pinto, an ex-member of the Côrtes, who, with his councillors, takes great interest in the development of the Riviera.

Cascaes has been known as a town from the time of King Affonso Henriques (1130-1185) and King Sancho (1185-1211). The earliest 'foral,' or what may be termed municipal charter, in existence, was granted by King Manuel, and bears the date November 15, 1514. It is preserved with great care in the Municipal Office Library.

The most interesting historical monument of Cascaes is the 'Cidadella,' or the Château-fort, which stands as the most westerly sentinel, not only of Portugal, but of the whole of Europe. Its earliest fortifications bear evidence that they are of the time of King John II. (1481-1495). The ships, which left on the ever-memorable discovery of the route round the Cape of Good Hope to India, were bidden farewell from its watch-towers; and it is from there that they were first discerned and welcomed on their return. But its glories have been also overclouded by dark days. In 1580 and in the following years, it took a prominent part in the defence of the independence of Portugal against the Spaniards. The Duke of Alva, who was in possession of Setubal, endeavoured to land his troops at Cascaes with the object of attacking Lisbon. Dom Diogo de Menezes, who had taken the command of the troops of Dom Antonio, the Prior of Crato, concentrated his small forces at Cascaes, and valiantly defended the fortress; but owing, as some say, to the superior forces of the enemy, or to treachery, according to others, was forced to surrender. He was barbarously decapitated by order of the Duke in the public square, on the plea that he had exceeded the right of defence!

In 1589, the British troops which had come to help Dom Antonio in his conflict against the Spaniards, after failing in their siege of Lisbon, retired, under the command of Norris, to Cascaes, where the Spanish Governor, Villafanha, believing that his Government had lost Lisbon, handed over the fort to Norris. Villafanha paid dearly for his mistake, for he, too, was decapitated soon afterwards by order of his own Government. The British troops, on returning to England, sailed from the Bay of Cascaes.

Later on, in 1640, Cascaes had its share in the War of Restoration. After the expulsion of the Spaniards, in the general defensive measures then undertaken, the fortifications of Cascaes merited special attention. The best available engineers were employed to alter and improve all the details, and the present state of the fortress represents the work begun in 1640 and hastily completed in 1641.

In 1807, during the Peninsular War, the Château-fort was occupied by French troops; but after the victory of Vimeiro and the Convention of Cintra, they had to vacate it, and it was, after 219 years, once again occupied by a British force, this time by sailors under the command of Cotton.

The year following, Cascaes supplied 200 soldiers, which constituted the nucleus of the famous 19th Infantry Regiment, which formed part of the brigade under the command, first of Blunt and afterwards of Coleman. It took a most prominent part in the Battle of Bussaco, and received special thanks for its gallantry. The patron saint of this regiment was St. Antony, and the troops always marched bearing in front his image. This image, which went through most of the battles of the Peninsular War, is still preserved, and the feast of the Saint, which is partly religious and partly patriotic, is celebrated every year with great pomp.

Finally, in 1831, the fortress of Cascaes was the first to be attacked by, and to exchange shots with, the French squadron under the command of Roussin.

We now reach the period when the Château was made use of as a political prison. Like other medieval buildings of its kind, it had a small space set apart, known as the Revelim, for the punishment of soldiers and others who committed any crime within its precincts. This part still exists, and is to be seen on the way to the Semaphoric Station. It occupies a small square, and is composed of twenty-two cells. In 1833, during the Civil War, 241 political prisoners were immured within this narrow compass, of whom fifty were stricken by cholera, which was then prevalent in Lisbon, and sixteen died within a very short time. It seems incredible what extreme measures political animosities will drive men to. The Revelim was known among the prisoners as 'Inferninho,' or the Little Hell, and it well deserves the name. The most important member of the group who suffered death was Manuel Borges Carneiro, an ex-member of the Côrtes and a distinguished lawyer, of whom it has been said:

> 'Que elogio mais alto e mais inteiro
> Que o nome de Manuel Borges Carneiro?'[1]

—'What praise is greater or more complete than the very name of Manuel Borges Carneiro?' He was buried near the wall of the park opposite the Sporting Club, and, in order to heap posthumous insult upon him, the corpse of an ordinary soldier was placed in his grave. Later on, in 1873, his remains were translated to the Parish Church.

Here ends the chequered history of this Château-fort, and it may be fairly asked whether all these incidents do not surpass, in their thrilling interest, those of the Château d'If and Chillon, which are visited by upwards of 50,000 tourists every year. Portugal has only to be known to be appreciated. It is at a great disadvantage from the fact that beyond its own borders the Portuguese language is not cultivated in Europe.

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[1] *Vide* 'Dic. Bibliographico,' by I. da Silva, vol. v., p. 378.

The recent history of the Château is of a quite different nature. We have already mentioned that the Dowager Queen took the young Princes there after their attack of measles. Since then the Château has undergone considerable change, and has become a Royal residence for about six weeks every year, from about October 1 to November 15, during which time some members of the Royal Family utilize the beautiful shores of Cascaes for the purpose of sea-bathing. This period naturally constitutes the height of the season on the Riviera, for it is then the time for regattas, lawn-tennis tournaments, pigeon-shooting, dances, picnics, theatres, bull-fights, etc. Golf has not yet become the fashion.

The Château-fort is open to the public during the absence of the Royal Family. It contains much of interest to the sight-seer, such as cisterns, inscriptions, guns, church, etc., which I will not further describe here. The Semaphoric Station, which was originally a chapel, where the political prisoners heard Mass, is open to the public, and its terrace commands one of the finest views of the Bay of Cascaes, and of the numerous steamers which constantly ply to and fro in all directions.

Cascaes has been visited by Queen Alexandra, King Edward VII., President Loubet, the King of Siam, and a host of other notable personages.

The 'Bôca do Inferno,' or Hell's Mouth, is well-known to sight-seers; so are the picturesque fishing-boats, and the sunburnt and stalwart fishermen.

The best and richest church of the municipal district of Cascaes is that of St. Domingos de Rana. Over the high altar is the much-admired 'Last Supper,' painted by Pedro Alexandrino de Carvalho, whose masterpiece is 'The Saviour of the World,' in the Cathedral of Lisbon.[1] The ceiling has a large fresco, representing the Virgin presenting a rosary to St. Domingos, which is attributed to the same artist.

There are several quarries of very good building stone and of excellent kaolin all round about Mont' Estoril; that of the Torre da Grilha, in the parish of St. Domingos, yields a kind of marble which was used to build the private chapel of the Marquis of Minas, at Manique de Baixo. At Atrozella, in the parish of Alcabideche, a mine was worked, it is said, for gold in 1517, and abandoned in 1820; also a mine was worked for coal at Estoril, near the baths of the Poças, in 1799.[2]

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[1] *Vide* 'Collecção de memorias relativa ás vidas dos pintores e escultores, architectos e gravadores portuguezes,' por Cyrillo Volkman Machado. Lisbôa, 1823.

[2] *Vide* 'Apontamentos para a villa e concelho de Cascaes,' por Borges Barruncho, 1 vol. in 8vo. Lisbôa, 1873.

The two sanatoria at Parede and at Carcavellos are well worth a visit; and the building where the Eastern Telegraph Station is located, as well as many others, is of historic interest. To do full justice to the Riviera would require a pamphlet to itself. I have indicated these few facts merely to show that the walks around Mont' Estoril are not devoid of interest. Botanists, zoologists and geologists will find ample material wherewith to satisfy their scientific yearnings, and those fond of sketching and photographing will find beautiful views in all directions.

D.—Books on Art in Portugal.

I have been asked more than once for the names of books on art in Portugal, and I think a list of the most important ones may be of interest to some of the readers of this booklet.

We occasionally find a writer who denies that the Portuguese are endowed by Nature with artistic tastes, and he bases his opinion upon the fact that Portugal has not produced a painter of European renown—one who could be classed with Rubens, Rembrandt or Vandyke, those masters of the Flemish school, with which the old Portuguese painters have a great resemblance. If such were the criterion, with which to judge a nation, it would lead to very absurd conclusions. It would follow that the French are not poetic, because they have failed to produce an epic poem similar to that of

Dante, Camõens, or Milton; or that Europeans have no religious feeling or sentiment, because Europe has not yet produced the founder of a great religion. Such argument is absurd. The genius of a nation is not to be gauged by *one* or *two* individuals, however eminent they may be, but by the collective taste and inclination of its population. It is true that, according to Justi, Portugal has not had a really independent school of painting. But if we turn our attention from painting to architecture, to sculpture (both in stone and wood), to tiles (*azulejos*), to religious vases and ornaments, to jewellery, lace, and other articles of domestic use, Portugal need not fear comparison with other nations of its size and population. Count A. Raczynski says: 'Many precious objects prove that the love for the beautiful and the taste for arts have at different epochs spread throughout Portugal'; and it could not be otherwise, given the favourable economic and political conditions of some of the epochs of Portuguese history and the favourable climate, for it is within the isothermic lines of Portugal that lie Rome and Athens.

Here are the names of books in English, French and German, which will enable the reader to form his own independent opinion on the subject. Those who know Portuguese will not find any difficulty in getting books in that language:

1. Murphy (James): 'Plans, Elevations, Sections and Views of the Church of Batalha.' Illustrated with 27 plates, 1 vol. in fol. London, 1795.

2. Raczynski (le Comte A.): 'Les Arts en Portugal.' Paris, 1846.

3. *Idem:* 'Dictionnaire historico-artistique du Portugal.' Paris, 1847.

4. Robinson (Sir J. C.): 'The Early Portuguese School of Painting, with Notes on the Pictures at Viseu and Coimbra, traditionally ascribed to "Gran Vasco."' London, 1866.

5. Silva (J. P. N. da): 'Dissertation artistique sur l'architecture en Portugal, depuis le XII. au XVIII. siècle.' Lisbonne, 1869.

6. *Idem:* 'Notice historique et artistique sur l'architecture des principaux édifices religieux du Portugal.' Lisbonne, 1873.

7. Lucas (Charles): 'L'Architecture en Portugal, mélanges historiques et archæologiques.' Paris, 1878.

8. Justi (C.): 'Die Portigiesische Malerei des 16 Jahrhunderts. Im Jahrbuch der Konigl. Preuss. Kunstsammlungen,' Bd. IX. Berlin, 1888.

9. Haupt (Albrecht): 'Die Baukunst der Renaissance en Portugal,' 2 vols. Frankfort, 1890-1895.

10. Soubies (Albert): 'Histoire de la musique en Portugal.' Paris, 1898.

11. Guimarães (Domingos): 'L'Art.' An article in *Le Portugal geographique, économique*, etc., by Brito Aranha and several other writers. Paris (no date). Librairie Larousse. (An excellent book for the general reader, published in 1900.)

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E.—CONVERSION TABLES.

Heights: Metres and English Feet.

Metres.	Feet.
1	3·2
2	6·5
3	9·8
4	13·1
5	16·4
6	19·6
7	22·9
8	26·2
9	29·5
10	32·8
20	65·6
30	98·4
40	131·2
50	164
60	196·8
70	229·6
80	262·4
90	295·2
100	328
200	656·1
300	984·2
400	1312·3
500	1640·4
600	1968·5
700	2296·6
800	2624·7
900	2952·8
1000	3280·8
2000	6561·7
3000	9842·6
4000	13123·5
5000	16404·4

Temperatures: Centigrade and Fahrenheit Degrees.

Cent.	Fahr.
50	122
49	120·2
48	118·4
47	116·6
46	114·8
45	113
44	111·2
43	109·4
42	107·6
41	105·8

Temperatures: Centigrade and Fahrenheit Degrees.

Cent.	Fahr.
40	104
39	102·2
38	100·4
37	98·6
36	96·8
35	95
34	93·2
33	91·4
32	89·6
31	87·8
30	86
29	84·2
28	82·4
27	80·6
26	78·8
25	77
24	75·2
23	73·4
22	71·6
21	69·8
20	68
19	66·2
18	64·4
17	62·6
16	60·8
15	59
14	57·2
13	55·4
12	53·6
11	51·8
10	50
9	48·2
8	46·4
7	44·6
6	42·8
5	41
4	39·2
3	37·4
2	35·6
1	33·8
Zero	32
−1	30·2
−2	28·4
−3	26·6
−4	24·8
−5	23
−6	21·2
−7	19·4
−8	17·6
−9	15·8
−10	14

Distances: Kilometres and English Miles.

Kilometres.	Miles.
1	0·6
2	1·2
3	1·8
4	2·4
5	3·1
6	3·7
7	4·3
8	4·9
9	5·5
10	6·2
20	12·4
30	18·6
40	24·8
50	31
60	37·2
70	43·4
80	49·7
90	55·9
100	62·1
200	124·2

Cubic Millimetres and Cubic Inches.

Millimetres.	Inches.
1	0·036
2	0·070
3	0·106
4	0·141
5	0·176
6	0·212
7	0·247
8	0·282
9	0·318
10	0·353
700	24·722
800	28·524

H. K. Lewis, 136, *Gower Street*, *London*, *W.C.*